

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/18752

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61K 31/4745, 31/437; C07D 471/04; A61K 29/00, 35/00, 37/00  
US CL : 514/293, 303546/82, 119, 120

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 514/293, 303; 546/82, 119, 120

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
CASONLINE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,935,222 A (H. HOEHN) 27 January 1976 (27.01.1976), columns 4-8, Examples 1-20.	1-7, 9-14, 18, 19
A	US 4,954,508 A (G. WINTERS) 04 September 1990 (04.09.1990), column 1, formula I.	1-19
X	QUIROGA et al. Regioselective synthesis of 4,7,8, 9-tetrahydro-2H-pyrazolo[3,4-b]-quinoline-5(6H)-ones. Mechanism and structural analysis. Tetrahedron. 2001, Vol. 57, pages 6947-6953, especially page 6947, Scheme 1.	1-5
X	Database on STN, AN 1982:142755, WEISSENFELS et al. "Reactions of glutaric acid imides and glutaric acid amides with the vilsmeier-haack reagent and subsequent reactions," abstract, Zeitschrift fuer Chemie, (1982), 22(1), 23-4, see entire abstract.	1-5
X	Database CAPLUS on STN, AN 1998:340806, QUIROGA et al. Reaction of 5-amino-1-aryl-3-methylpyrazoles with benzylidene derivatives of Meldrum's acid: synthesis and characterization of pyrazolo[3,4-b]pyridinones, abstract, Journal of Heterocyclic Chemistry, (1998), 35(2), 409-412, see entire abstract.	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;"

document member of the same patent family

Date of the actual completion of the international search

15 February 2005 (15.02.2005)

Date of mailing of the international search report

18 APR 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

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## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database on STN, AN 1997:228838, OHKI et al. 'Studies on 3'-quaternary ammonium cephalosporins-III. synthesis and antibacterial activity of 3'-(3-aminopyrazolium)cephalosporins,' Bioorganic & Medicinal Chemistry, (1997), 5(3), 557-567, see entire abstract.	1-5
X	Database on STN, AN 1981:550528, WEISSENFELS et al. 'Synthesis of pyrazolotetrahydropyridones via the Vilsmeier-Haack-reaction of glutaric acid imides,' Zeitschrift fuer Chemie, (1981), 21(7), 259-60, see entire abstract.	1-5

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## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
  2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
- Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

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## BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 4-8, and claims 1-3, 9-19 in part, drawn to a compound of formula I, the composition and method of use thereof.

Group II, claim(s) 1-3, 9-19 in part, drawn to a compound of formula II, the composition and method of use thereof.

Group III, claim(s) 1-3, 9-19, drawn to a compound of formula III, the composition and method of use thereof.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the Group I tricyclic compound of formula I, the Group II bicyclic compound of formula II with a carbonyl substituent and the Group III bicyclic compound with an oxo substituent would not have been of sufficient similarity to allow a Markush grouping exhibiting unity, absent some teaching of equivalence in the prior art.